ART. XXXIII.—*Traité d'Anæsthesie Chirurgicale contenant la Description et les Applications de la Methode Anæsthesique de M. Paul Bert.* Par le Docteur J. B. ROTTENSTEIN, Membre de l'Academie Leopoldina Carolina, de la Societe Odontolgique de New York, etc. 8vo. pp. 428. Paris: Germer Baillière et Cie. 1880.

A Treatise on Surgical Anæsthesia, with the Description and Mode of Application of the Anæsthetic Method of Paul Bert. By Doctor J. B. ROTTENSTEIN.

WE presume our readers will share in the regret we feel that Dr. Rottenstein's work did not come to hand in time to notice it with other recent works on Anæsthetics. The subject has been so recently considered at some considerable length that it is unnecessary to go over the ground again. Nevertheless, a contribution to the study of this important class of medicines, of such pretensions and character as this, cannot be permitted to pass in silence, and we must make an attempt to present some statement of its contents, and place an estimate upon its value.

It is to be seen from the title appended to the author's name, as well as from the list of works he has already published, that he belongs to the dental fraternity. In stating this it is by no means intended to imply that therefore he is not qualified to teach us something in regard to anæsthetics, or that he could not give us a good book. It suggests, however, at the outset, that he has been unfortunate in the choice of a title, and this is really the case. He has copied the title of the work of MM. Perrin and Lallemand, which was issued seventeen years ago, has followed closely the plan of those authors, as the whole field of anæsthetics is gone over, while his practical acquaintance with them is restricted, or almost restricted, to a single one. The work should have been called "A treatise upon nitrous oxide gas as an anæsthetic, and a plea for a more extended use of it in general surgery." Whatever there is in the book of value, and whatever there may be in it new or deserving of consideration relates to this branch of the subject, and upon this branch of the subject it is a contribution of very considerable value.

We find already in the preface indications of the stormy debate which has attended the choice of an anæsthetic in France. Discussion of the merits of the different articles has been carried on, not only with warmth, but at times with the passion of partisanship. "Chloroform, pure and well administered, never kills;" "Chloroform is the most dangerous of anæsthetics;" "The protoxide of nitrogen asphyxiates and does not anæsthetize;" these have been rallying cries of parties for years, and men who canvassed with calmness and moderation the relative value of different operative procedures became, all at once, excited and passionate when the question of anæsthetics was opened. Finally, it has settled down to chloroform for Paris and the rest of France, ether for Lyons. But this is not the position of the author. He would banish chloroform from practice except for military service and in obstetrics, prefers ether as "infinitely safer," but maintains that nitrous oxide has not yet had accorded to it in France the position it deserves. Introduced by Dr. Colton, its use has spread and become general among dentists, while it has been the subject of but little scientific study, and but few attempts have been made to adapt it to general surgery. In this respect, the author says, the French have been far surpassed by "our neighbours across the channel, more practical and less prejudiced than we are."

It follows as matter of course that the larger portion of the book is devoted to nitrous oxide, and a good deal of it taken up with the consideration of controversial points which would not be necessary here. The longest chapter, extending to fifty-eight pages, is upon the physiological action of this gas. The author has availed himself of the labours, and, indeed, given much in full, verbally, of the recent contributions in this field of such men as Krishaber, Jolyet, and Blanche, Zuntz and Goldstein, and Paul Bert. Some of the especial points presented are the innocuousness of the gas, the fact that it has really an anæsthetic effect independent of and preceding asphyxia, and that blood pressure and cardiac action "change under the influence of N_2O in the same manner as under the influence of asphyxia by suffocation."

Figures and full descriptions are given of the various apparatus for the administration of nitrous oxide, and among them are the portable ones of Johnston of this country, and to them is given the preference over all others. Barth's and Clover's apparatus for the combined administration of ether and nitrous oxide are also figured and described.

In regard to the great relative and almost absolute safety of nitrous oxide, Dr. Rottenstein is, of course, very emphatic, and his work furnishes higher figures upon this point than we have anywhere else found. He publishes a letter from Dr. Colton, dated in New York, May, 1877, in which it is stated that from the time of beginning the record up to date there had been about one hundred thousand administrations by the Colton Dental Association, without a single death, and "without any accident of sufficient gravity to necessitate transporting the patient in a vehicle." About one patient in a hundred and fifty suffered from subsequent nausea. In summing up, towards the close, the author thinks that without drawing upon the imagination, the number of inhalations of nitrous oxide as an anæsthetic may be placed at more than a million, and he admits only two, well-authenticated cases, of death. He enforces this array of figures with the powerful argument that this result has been obtained by administrators of all grades as to competency and prudence, and under the certain use of much badly-prepared gas.

The one great drawback to the use of nitrous oxide as an anæsthetic in general surgery is the brief duration of its effects. To the anæsthesia it produces rapidly succeed symptoms of asphyxia, which, if the administration be prolonged, would speedily become fatal. The figures and facts presented above cannot fail to suggest at once the thought and the desire that some plan should be devised to prolong the action of this gas, and thus extend its application to the purposes of general surgery. The attempt has been made, and "anæsthesia by the method of Paul Bert," which occupies a place on the title-page of Dr. Rottenstein's book, is a method designed to solve this difficult and important problem. The theory of M. Bert is that, as the gas must be administered pure, this signifies that its tension must equal that of the atmosphere, and that, therefore, if the pressure could be increased to two atmospheres a mixture of fifty per cent. of the gas and air could be respired, anæsthesia be produced, and the actions of the organism proceed normally. Experiment sustained the theory. Animals which were caused to respire a mixture of five-sixths of protoxide of nitrogen and one-sixth of oxygen under a pressure of one-fifth of an atmosphere, became rapidly profoundly anæsthetized, and remained so any length of time without symptoms of asphyxia supervening. The blood kept its normal colour, the heart continued beating with regularity and with its usual force. "In a word, all the phenomena of vegetable life continued with regularity, while those of animal life were absolutely abolished." Upon restoring the animal to the air it recovered sensibility and consciousness almost immediately.

The rapid cessation of the effects of nitrous oxide is held by the author all through this book to be due to the fact that the gas is simply suspended in the blood, while ether and chloroform enter into chemical combinations in the organism, combinations which it requires time to break up for the process of elimination of the anæsthetic agent. He constantly speaks of this as an established chemical fact, but does not give the proof or direct references to where it can be found.

The next step was to test M. Bert's method clinically. An apparatus was provided, a chamber in which an increase of atmospheric pressure could be effected, and an ingrown toe-nail removed by the eminent surgeon Labbé. Another eminent operator, no less an one than M. Péan, tested the new method, and he has performed a number of operations under it, some of them of severity and of considerable duration.

The administration of a mixture of nitrous oxide gas and oxygen under increased atmospheric pressure is, then, the method of anæsthesia of M. Paul Bert, the method which Dr. Rottenstein has adopted, advocates, and champions.

Two objections at once present themselves. The first, relates to the special apparatus necessary for its administration. This is such that Dr. R. admits at once that the method cannot be adopted in country practice, or anywhere but in large cities. Nor will the doubts upon this point as to its use anywhere be allayed by an inspection and study of the kind of apparatus required as figured and described in this book. A receptacle of sheet iron (*cloche pneumatique*), large enough to contain patient, surgeon, and assistants, must be furnished, and this is to be provided with pneumatic pump, with apparatus for supplying the gases and for insuring ventilation! This plain statement is sufficient; the particulars of description need not be given—for the present at least. Nor could the question of cost be overlooked or forgotten. As such an innovation must be brought into the profession through the hospitals the author makes an estimate for the benefit of these institutions, and as in hospitals there is teaching, the receptacles must be large enough to contain students. They can be made of any size, and the author puts the price of one large enough to contain three hundred persons at "*scarcely* 30,000 francs!" while for 15,000 francs, or $3000, a complete apparatus can be obtained with a capacity of forty persons!

The second objection is that sufficient proof of the great superiority, or absolute safety, of this mode of anæsthesia is not furnished. To what extent experiment upon animals has been pushed is not stated in this book. Possibly it is detailed in M. Bert's communications to the Academy of Science,[1] but it is not here. As to the clinical proof, it amounts to two operations by Labbé, and sixteen by Péan, a total which is not a respectable fraction of what can be presented in favor of bichloride of ethidene, or bromide of ethyl. To assume that the agent, being nitrous oxide, is therefore safe, is to rest the question just where it was before the method was designed and applied. We cannot agree, therefore, with the author, when he says, speaking of the first two operations, that "these two very conclusive observations permit us already to give a definite decision upon the value of this method," nor can we believe, with him, that by this method "the protoxide of nitrogen has entered into the domain of grand surgery."

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[1] Comptes Rendus, 1878, 1879.

We are happy to find that the author is a warm supporter of the use of chloroform in physiological labour. We find also in his book confirmation of the statement that opposition to the use of this agent simply for the relief of the sufferings of parturition is limited to a very few of the leading obstetricians of France. Dr. Rottenstein mentions only Pajot and Pinard, but Depaul, in his *Obstetrique Clinicale*, decidedly opposes this practice. Singularly enough Pajot does not oppose it on account of its danger, but denies its efficacy, *i. e.*, the fact of the relief of pain by small doses and intermittent inhalations! That a man of his position and ability should maintain such a position upon a point so easily submitted to personal experience, and so readily shown to be untenable at any bedside, is either a wondrous instance of inequality of mental action or of the strength of prejudice. But what shall we say of the state of affairs where an author has to enter upon a laboured argument to prove that chloroform does not cause, in women under its influence, "a compromising loquacity," in which delicate secrets are betrayed! We are glad to learn that such things are not believed by the experienced practitioners of France, and that it should be considered necessary to enter into any consideration of it is enough to upset the patience of a saint![1] As supporters and defenders of the administration of chloroform in natural labour in France the author names, besides "the lamented Campbell," Danyau, Bailly, Bucquoy, Legroux, Hervieux, Fereol, and Dumontpallier.

We close with a brief notice of the two opening chapters of the work, which are historical and devoted to the discovery and progress of anæsthesia. In regard to the latter we have the important and startling piece of information that, upon the appearance of chloroform American surgeons received it "with a certain coldness! and, after having experimented with it, finished by entirely rejecting it!" As to the discovery, the author devotes himself to the exposition of the claims of Horace Wells. He notices the claim of Marion Sims for Dr. Crawford Long as the discoverer of anæsthesia, but decides that "publicity is the touchstone of invention," and that the dates decide the question.

"It appears to us, therefore, that Marion Sims has yielded too readily to the impulses of his generous heart in accepting the claims of Long, who, if he really discovered anæsthesia, committed the immense wrong of not making known a discovery which would have immortalized his name, and, at the same time, rendered such great service to humanity."

The author has graced his book with an excellent steel engraving of Wells, and urges his claims with energy and enthusiasm. J. C. R.

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[1] We gather from the author that French practitioners do not believe in the erotic effects sometimes caused by anæsthetics!—such effects "as are attributed to them by the author of *Nemesis*," whoever that may be, "in the following lines:—

"Là c'est le doux repos, l'extase, le plaisir,
Le spasme de l'amour, quand l'éther hallucine
Le jeune femme en proie aux tourments de Lucine;
Oh! d'un double mystère ineffable pouvoir,
Au momente qu'elle enfante, elle croit concevoir!"